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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/551,051	04/18/00	BASAK	A

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CONNOLLY BOVE
LODGE & HUTZ LLP
PO BOX 2207
1220 MARKET STREET
WILMINGTON DE 19899

EXAMINER	
SHOSHO,C	
ART UNIT	**PAPER NUMBER**
1714	5

DATE MAILED: 12/08/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/551,051	Basak et al.
Examiner	**Group Art Unit**
Callie Shosho	1714

☐ Responsive to communication(s) filed on _____

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-21 is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-21 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8-9, 13-17, and 20-21 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claims 9, 13, 20, and 21 disclose an ink "having a particle size of about 128-450 nm, and showing an increase of about 10-15 from the dry pigment particles". The scope of the claims is confusing because it is not clear what is meant by "an increase of 10-15 from the dry pigment particles". Are the ink particles increased in size from the dry pigment particles by 10-15 nm, by 10-15%, 10-15 times, etc?

(b) Claims 8, 13, 15, and 20-21 disclose the conductivity in the ink in "μS". The scope of the claim is confusing because conventionally, as found for instance in Nigam et al. (U.S. 5,693,127,) conductivity is measured in "μS/cm". Clarification is requested.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimatsu et al. (U.S. 5,913,971) in view of either Anton et al. (U.S. 6,005,023) or Ma et al. (U.S. 5,085,698), Tsutsumi et al. (U.S. 5,852,074), Sano et al. (U.S. 5,324,349), and either Lin et al. (U.S. 5,531,818) or Nigam et al. (U.S. 5,693,127).

Fujimatsu et al. disclose an ink and method of printing wherein the ink comprises 1-5% carbon black, 0.03-5% biocide, 0.5-10% neutralized styrene/acrylic dispersant, 50-95% water, 1-30% ethanol, hyperdispersant such as Solsperse 27000, surfactant, and anti-foaming agent. It is further disclosed that the ink has pH of 7-10, viscosity of 0.8-15 cP, surface tension of 25-60 dyn/cm, and particle size of less than 450 nm (col.2, lines 27-31 and 45-52, col.3, lines 28-40 and 61, col.4, lines 30-37, col.4, line 57-col.5, line 4, col.5, lines 14-16, 33-39, and 52-57, col.6, lines 44-54, and col.9, line 46).

The difference between Fujimatsu et al. and the present claimed invention is the requirement in the claims of (a) ammonium hydroxide, (b) amount of anti-foaming agent, (c) acrylic emulsion, and (d) conductivity of the ink.

With respect to difference (a), Fujimatsu et al. disclose that the dispersant is solubilized by amine such as morpholine or dimethylethanolamine, but do not explicitly disclose the use of ammonium hydroxide.

Anton et al., which is drawn to ink jet inks, disclose the equivalence and interchangeability of amine including dimethylethanolamine, as disclosed by Fujimatsu et al., with ammonium hydroxide when solubilizing a dispersant (col.5, lines 26-33).

Alternatively, Ma et al., which is drawn to ink jet inks, disclose the equivalence and interchangeability of amine including morpholine, as disclosed by Fujimatsu et al., with ammonium hydroxide when solubilizing a dispersant (col.6, lines 15-19).

Although there is no disclosure in Fujimatsu et al. and either Anton et al. or Ma et al. that the solubilizer volatilizes upon heating, given that Fujimatsu et al. is drawn to ink jet inks which are heated upon printing and further given that either Anton et al. or Ma et al. disclose ammonium hydroxide identical to that presently claimed, it therefore would have been natural for one of ordinary skill in the art to infer that the ammonium hydroxide intrinsically volatilizes upon heating.

With respect to difference (b), Fujimatsu et al. disclose the use of anti-foaming agent, but do not explicitly disclose the amount in which the anti-foaming agent is used.

Tsutsumi et al., which is drawn to ink jet inks, disclose the use of 0.005-5% anti-foaming agent and disclose that if the amount used is too small, it is difficult to remove small bubbles from the ink, while if the amount is too large, cissing occurs in the ink which degrades print quality (col.10, lines 29-41).

With respect to difference (c), Sano et al., which is drawn to ink jet inks, disclose the use of 0.1-40% acrylic emulsion having polymer content of, for instance, 50%, in order produce an ink with high optical density (col.2, lines 10-22, col.4, line 11-col.5, line 11, col.5, lines 26-24, and col.7, line 47).

With respect to difference (d), there is no explicit disclosure in Fujimatsu et al. of the conductivity of the ink.

Lin et al., which is drawn to ink jet inks, disclose that inks typically possess conductivity of less than 7000 μS/cm in order to produce an ink that will not cause unwanted or premature heater damage, corrosion, ink instability, or nozzle clogging (col.12, lines 26-37).

Alternatively, Nigam et al., which is drawn to ink jet inks, disclose that inks typically possess conductivity of 2000-3000 μS/cm or higher in order that the ink has sufficient conductivity for ink jet printing (col.4, lines 52-63).

In light of the disclosure of either Anton et al. or Ma et al. of the equivalence and interchangeability of amine solubilizing agents such as those disclosed by Fujimatsu et al. with ammonium hydroxide solubilizing agents, given the motivation for using specific amount of anti-foaming agent disclosed by Tsutsumi et al., given the motivation for using acrylic emulsion disclosed by Sano et al., and further given the motivation for producing an ink with specific conductivity disclosed by either Lin et al. or Nigam et al., it therefore would have been obvious to one of ordinary skill in the art to use ammonium hydroxide, specific amount of anti-foaming agent, and acrylic emulsion in, as well as to control the conductivity of, the ink of Fujimatsu et al. in order to produce an ink that has no small bubbles or cissing, high optical density, sufficient conductivity of ink jet printing, and does not cause corrosion, nozzle clogging, or unwanted or premature heater damage, and thereby arrive at the claimed invention.

6. Claims 1-10, 13-14, 17-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (U.S. 5,658,376) in view of either Anton et al. (U.S. 6,005,023) or Ma et al. (U.S. 5,085,698), Tsutsumi et al. (U.S. 5,852,074), Sano et al. (U.S. 5,324,349), and either Lin et al. (U.S. 5,531,818) or Nigam et al. (U.S. 5,693,127).

Noguchi et al. disclose an ink and method of printing wherein the ink comprises 1-20% carbon black, 0.03-1% surfactant, 0.1-2.5% neutralized styrene/acrylate dispersant, 25-87% water, and 5-40% ethanol. It is further disclosed that the ink has pH of 7-10, viscosity of 2-6 mPa s, surface tension of 35-55 dyn/cm, and particle size of 80-200 nm (col.3, lines 30-40, col.4, lines 7-50, col.6, line 67-col.7, line 2, col.7, lines 34-37, 46-48, and 54-56, col.9, lines 21-25, col.10, lines 11-22, and col.11, lines 12-14, 18-20, and 29-39)

The difference between Noguchi et al. and the present claimed invention is the requirement in the claims of (a) ammonium hydroxide, (b) anti-foaming agent, (c) acrylic emulsion, and (d) conductivity of the ink.

With respect to difference (a), Noguchi et al. disclose that the dispersant is solubilized by amine such as diethanolamine, but do not explicitly disclose the use of ammonium hydroxide.

Anton et al., which is drawn to ink jet inks, disclose the equivalence and interchangeability of amine including diethanolamine, as disclosed by Noguchi et al., with ammonium hydroxide when solubilizing a dispersant (col.5, lines 26-33).

Alternatively, Ma et al., which is drawn to ink jet inks, disclose the equivalence and interchangeability of amine including diethanolamine, as disclosed by Noguchi et al., with ammonium hydroxide when solubilizing a dispersant (col.6, lines 15-19).

Although there is no disclosure in Noguchi et al. and either Anton et al. or Ma et al. that the solubilizer volatilizes upon heating, given that Noguchi et al. is drawn to ink jet inks which are heated upon printing and further given that either Anton et al. or Ma et al. disclose ammonium hydroxide identical to that presently claimed, it therefore would have been natural for one of ordinary skill in the art to infer that the ammonium hydroxide intrinsically volatilizes upon heating.

With respect to difference (b), Tsutsumi et al., which is drawn to ink jet inks, disclose the use of 0.005-5% anti-foaming agent in order to prevent the formation of small bubbles and cissing in the ink (col.10, lines 29-41).

With respect to difference (c), Sano et al., which is drawn to ink jet inks, disclose the use of 0.1-40% acrylic emulsion having polymer content of, for instance, 50%, in order produce an ink with high optical density (col.2, lines 10-22, col.4, line 11-col.5, line 11, col.5, lines 26-24, and col.7, line 47).

With respect to difference (d), there is no explicit disclosure in Noguchi et al. of the conductivity of the ink.

Lin et al., which is drawn to ink jet inks, disclose that inks typically possess conductivity of less than 7000 μS/cm in order to produce an ink that will not cause unwanted or premature heater damage, corrosion, ink instability, or nozzle clogging (col.12, lines 26-37).

Alternatively, Nigam et al., which is drawn to ink jet inks, disclose that inks typically possess conductivity of 2000-3000 μS/cm or higher in order that the ink has sufficient conductivity for ink jet printing (col.4, lines 52-63).

In light of the disclosure of either Anton et al. or Ma et al. of the equivalence and interchangeability of amine solubilizing agents such as those disclosed by Fujimatsu et al. with ammonium hydroxide solubilizing agents, given the motivation for using anti-foaming agent disclosed by Tsutsumi et al., given the motivation for using acrylic emulsion disclosed by Sano et al., and further given the motivation for producing an ink with specific conductivity disclosed by either Lin et al. or Nigam et al., it therefore would have been obvious to one of ordinary skill in the art to use ammonium hydroxide, anti-foaming agent, and acrylic emulsion in, as well as to control the conductivity of, the ink of Noguchi et al. in order to produce an ink that has no small bubbles or cissing, high optical density, sufficient conductivity of ink jet printing, and does not cause corrosion, nozzle clogging, or unwanted or premature heater damage, and thereby arrive at the claimed invention.

7. Claims 1-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano et al. (U.S. 5,243,349) in view of either Anton et al. (U.S. 6,005,023) or Ma et al. (U.S. 5,085,698), and Tsutsumi et al. (U.S. 5,852,074).

Sano et al. disclose an ink composition comprising 0.5-25% carbon black, 0.06-3% neutralized styrene/acrylic dispersant, 0.1-40% acrylic emulsion with 40% polymer content, water, ethanol, surfactant, and biocide. Example 12, for instance, discloses that the ink contains approximately 75% ethanol-water (col.2, lines 35-38 and 56-64, col.3, lines 12-15, 28-33, 47-49, col.4, lines 12-16, col.5, lines 18-37, and col.6, lines 25-29, 38-42, and 55-56).

The difference between Noguchi et al. and the present claimed invention is the requirement in the claims of (a) ammonium hydroxide and (b) anti-foaming agent.

With respect to difference (a), Sano et al. disclose that the dispersant is solubilized by amine such as triethylamine, but do not explicitly disclose the use of ammonium hydroxide.

Anton et al., which is drawn to ink jet inks, disclose the equivalence and interchangeability of amine including triethylamine, as disclosed by Sano et al., with ammonium hydroxide when solubilizing a dispersant (col.5, lines 26-33).

Alternatively, Ma et al., which is drawn to ink jet inks, disclose the equivalence and interchangeability of amine including triethylamine, as disclosed by Sano et al., with ammonium hydroxide when solubilizing a dispersant (col.6, lines 15-19).

With respect to difference (b), Tsutsumi et al., which is drawn to ink jet inks, disclose the use of 0.005-5% anti-foaming agent in order to prevent the formation of small bubbles and cissing in the ink (col.10, lines 29-41).

In light of the disclosure of the equivalence and interchangeability of amine solubilizing agents such as those disclosed by Sano et al. with ammonium hydroxide solubilizers and given the motivation for using anti-foaming agent disclosed by Tsutsumi et al., it therefore would have been obvious to one of ordinary skill in the art to use ammonium hydroxide and anti-foaming agent in the ink of Sano et al. in order to produce an ink that has no small bubbles or cissing, high optical density, and thereby arrive at the claimed invention.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yanagi et al. (U.S. 5,736,606) disclose an ink jet ink containing an acrylic emulsion.

Fujisawa et al. et al. (U.S. 5,997,136) disclose an ink jet ink containing 5-40% acrylic emulsion, 0.2-10% pigment, 0.05-10% surfactant, biocide, and dispersant, however, the amount of dispersant is outside the scope of the present claims.

Hauser et al. (U.S. 5,106,417) disclose an ink jet ink comprising carbon black, neutralized polyacrylic acid, 2-10% ethanol, 2-15% humectant, and biocide and further disclose the conductivity, pH, and viscosity of the ink, however, there is no disclosure of an acrylate emulsion or surface tension of the ink.

Kubota et al. (U.S. 6,039,796) disclose an ink jet ink comprising dispersant, pigment, resin emulsion, and ethanol, however, there is no disclosure that the dispersant is solubilzed and no disclosure of the viscosity, surface tension, or conductivity of the ink.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie Shosho whose telephone number is (703) 305-0208.The examiner can normally be reached on Mondays-Thursdays from 7:00 am to 4:30 am. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Callie Shosho

12/5/00